



**Sharing Knowledge across the Mediterranean 9th Conference, Lisbon, Portugal,
May 15th to 17th 2014**

Recommendations

1 - Development of Universities in SSA

In the 1980s, the IMF and the World Bank made the absurd decision that Universities were a luxury that Africa could not afford and should limit itself to primary and secondary education. Despite a recent apology, the present system is grossly inadequate to meet a surging demand. ***SKF recommends that all parties (funding agencies and also African governments) strive to remedy this situation before 2018.***

2 - Fighting the Digital Divide

This has been one of the mainstays of SKF since 2007. We were one of the main agents in the implementation of "Africa Connect", the first phase of which brought 16 million euros in 2012 to the Research and Education Networks (NRENs) of several countries. High bandwidth connections, benefitting from the surge of submarine cables (from 120 Gb to 30 Tb) are still expensive on the average, even if they have fallen to a more affordable 200 USD/Mb/month in some countries. This is still 10 times more than in France, the US or Japan. ***SKF recommends efforts to improve this situation, not only by GEANT, but also by African governments that have to provide 20% of the European effort and should consider this as a national priority.***

3 - The integration of women in the workforce in MENA and Africa

This is a key condition for the economic development on which prosperity depends. ***This should be done at all levels, from education and training to access to management and executive positions in larger companies, as well as the development of small enterprises (such as Argan oil in Morocco) helped by micro credit.***

4 - Energy

This is a key to development. ***SKF recommends the following diversified portfolio of actions.*** Large scale transport of electricity from where it is produced to where people live is essential, and SKF will organize a follow-up to the Lisbon meeting at CERN on this topic in the fall of 2014. There are plenty of resources of natural gas offshore in Africa and the Eastern Mediterranean. However, the success of gas fracking in the US is not necessarily repeatable in Africa. One resource not to be forgotten is the abundance of clathrates at the bottoms of the oceans, which could meet the world's energy needs for thousands of years. Nuclear energy is by far the most carbon-free source of energy. Small and medium-sized reactors are well adapted to the needs of emerging countries and are receiving attention in both France and the US.

5 - Good Governance based on the rule of law and the quality of life

This is another key to progress in Africa. ***SKF recommends the Mo-Ibrahim Index.*** This provides a set of metrics that is constantly perfected, which governments use increasingly and SKF intends to monitor closely. It reveals, e.g., that there is no clear-cut definition of poverty in every country. It shows which countries have good records (Cabo Verde and Botswana lead the pack, and Angola and Mozambique have made progress, whilst Guinea Bissau is the worst).

6 - Front-line science

SKF considers that the participation of scientists from emerging countries in frontline science is the basis for long-term development. Over the past decade, CERN has successfully enabled countries from the MENA and Africa to achieve this goal. In addition to fundamental and applied research, it fulfills teaching and outreach missions. The CERN Council has formulated a long-term strategic plan to preserve CERN front-rank status in the coming decades. The LHC will be upgraded in stages, in both luminosity (x



100) and energy (7 to 14 TeV). The discovery of the Higgs boson should be followed by studies of many open questions beyond the Standard Model. Beyond the LHC, various accelerator options under consideration, including a 80 to 100 km ring under Lake Geneva and 50 km linear collider, and research on plasma acceleration is underway. The next big project in Africa is the SKA, a radio-telescope capable of detecting Hydrogen in all galaxies via its 20 cm radiation. Over the next 20 years this will bring considerable scientific and technical life to several Southern Africa countries. **We advocate mutual exchange of information between CERN and SKA management.** We believe that the often heard complaint about "Brain Drain" is misguided : it is legitimate that African scientists migrate to international universities and research centers to develop fully their potential and qualifications. This can be turned into "Brain Gain" if African governments attracts those willing to come back by giving them the necessary research opportunities and status in their country of origin (as China has done in the last 30 years). It is now possible to work at a distance using broadband Internet. **Collaboration between African scientists of different countries is essential to assemble a critical mass able to enter international collaborations in pure and applied science.** An interesting development is that of "Low Cost Labs" able to monitor environmental and agricultural parameters using devices now available in the mass market.

7 - Transportation networks

These are dire needs in Africa. Urban transport is changing the city landscape from the Maghreb in the north to Capetown and Johannesburg in South Africa. Well-maintained paved roads are essential to connect the interior to the ports where the commercial exchanges with the rest of the world are concentrated. The development of a railway network for freight is a necessity for the mining industry. It is also a factor in creating a critical mass in the market for agricultural products. **We recommend that international agencies should give more importance to the development of road and rail infrastructure in Africa.**

8 - Urbanisation and rural life in SSA

Because of overall population growth, the influx to cities (mostly in slums) does not diminish the population in the countryside. The open question is of the best way to provide food to cities. Subsistence agriculture is untenable and will have to be modernized, e.g., via irrigation and the use of machines. **SKF supports the use of GMOs, where appropriate, as well as traditional methods of increasing agricultural productivity.**

9 - Science for Peace and the Middle East

SKF is very proud that, following Morocco four years ago, a Palestinian student has been appointed as a CERN doctoral student and has started work on ATLAS in April. This was made possible by a grant by the Marc Rich Foundation that covers his first year, and SKF will search for other donors for the next 1 or 2 years necessary to complete his PhD. **We strongly support the SESAME project based in Jordan which should begin operating soon.** This unique endeavour, founded by UNESCO with a convention similar to that of CERN is an outstanding example of scientific collaboration between Israel, Arab and Muslim countries including Iran and Turkey. Our other involvement since 2006 has been with the management of water in the three countries of the Jordan basin. A first agreement in December 2013 is very promising as a prelude to the Red-Dead project. **We support strongly its implementation despite the very tense political situation.** Israel, Jordan and the Palestinian Territories are in the worst situation of hydric stress in the world (150m³/cap/year, compared to the 500 m³/cap/year officially recommended) and this falls to 50 m³/cap/year in Gaza.

10 - The future of teaching in the framework of the digital revolution

The proliferation of MOOCs and similar free access video courses that started at MIT and other major American Universities is now followed by hundreds of millions worldwide, and it undoubtedly offers an avenue for lifetime education. There are indications, however, that this up-down approach is not complete, and **SKF considers that live interaction with a teacher in a lecture hall or by virtual means will continue to be important in the future.**



This will have to be introduced in emerging countries, hence the importance of adequate equipment for lecture halls and affordable high-bandwidth connections. ***African governments and funding agencies should consider this as a national priority.***

11 - Renewable energy development in Morocco

The solar energy project at Ouarzazate has benefited from international as well as national funding. It has an impact on regional development, agriculture, and tourism. It has created jobs in "green technologies", including capacity building to learn new skills. It will help satisfy energy needs in the face of rising prices of fossil fuels. ***SKF supports the use of concentrated solar power (CSP) in order to help overcome the intermittent character of solar energy.***

12 - Land Grabbing in SSA

There has been a lot of attention since 2008 on massive purchases of land in Africa by foreign governments. The strong interest in biofuels, the low cost of land compared to OECD countries, and the very low cost of labour make fertile parts of Africa an extremely attractive investment in the context of the global financial crisis. The attraction of Carbon Credits adds an element of speculation. On the other hand, it is striking that the announced purchases result in far less signatures and very few actual exploitations. Most of the purchases are in fact from urban buyers. Many countries do not have written property titles, a source of uncertainty for buyers and hence an obstacle to obtaining capital for development. ***We strongly support the efforts towards transparency by some African governments (such as Benin) which will sell land via public auctions.***

13 - The Millenium Goal of Eradicating Poverty in 2030

This will undergo its halfway assessment in one year. There are encouraging successes, e.g., in the availability of water and electricity, which have however been offset by the population increase. Poverty persists in the uneven progress towards eradicating plagues such as polio, and the lack of food and potable water following catastrophes. Emergency supplies from the FAO and other international bodies inevitably takes days to reach populations in countries such as the Philippines or Thailand. ***We strongly urge these agencies to pre-position emergency supplies (much as the military does for ordnance) which would alleviate sufferings and make sense economically compared to sending emergency food and water by plane, helicopter and the like.***

14 - Problems expected to be intractable even by 2030

Only two years ago the lack of basic sanitation (latrines) and a clean kitchen stove had no solution, but new technologies offer potential solutions. The Bill and Melinda Gates (BMG) Foundation has called for a waterless toilet system that would cost less than 5 cents per person per day, and one possible solution is being developed at Cranfield University. The initial capital cost of providing these devices would be high, but the BMG Foundation is apparently ready to make this initial investment, so as to make the costs affordable to private companies that can make a profit by charging "5 cents a day". The Clean Stove is another "cause célèbre", causing millions of deaths a year according to the WHO as well as contributing to deforestation. The answer is less obvious and depends on the location: in cities and suburbs gas bottles could be supplied for free, whereas a project in Maputo (Mozambique) plans to use biogas from animal waste, a solution that could have broad application. ***SKF recommends the development and deployment of appropriate technology to resolve these problems.***

15 - Capacity Building

At all levels, for both technicians and managers, this is essential for development. The ICTP plays a key role in that respect both in Trieste and also by training people in African countries. An interesting example is in Malawi, a landlocked country where a technology has been deployed to use part of the spectrum previously allocated to TV to reach the countryside and to train local technicians to master that technology.